

# Zero Retries issue 0205 2025-06-06

*Zero Retries is an independent newsletter promoting technological innovation in and adjacent to Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Radios are computers - with antennas! Now in its fourth year of publication, with 2800+ subscribers.*

About Zero Retries

**Steve Stroh N8GNJ, Editor**

Email - [editor@zeroretires.net](mailto:editor@zeroretires.net)

On the web: <https://www.zeroretires.org/p/zero-retries-0205>

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## Request To Send

*Commentary by Editor Steve Stroh N8GNJ*

### Paid Subscribers Update

My thanks to **Prefers to Remain Anonymous 32** for *renewing* as an **Annual Paid Subscriber** to Zero Retries this past week!

*Financial support from Zero Retries readers is a significant vote of support for the continued publication of Zero Retries.*

### Still a Bit Travel Lagged

I'm still a bit travel lagged, which is part of why this issue was late publishing into Friday evening. But in addition to a short week from traveling, I also spent time working on someone else's project which ended up being postponed or shelved (to be determined)... which is frustrating.

This isn't the first time this has happened, and this latest wastage wasn't the only organization that has done this. What's different between then and now is that previously, I had "slack time" that such time wastage could be accommodated. But in Summer 2025, not so much.

Thus I find myself at a point with Zero Retries where it, and some other major Zero Retries writing projects this Summer will be *the priority for my writing time*. I don't want get to the point of automatically declining to help worthy projects with my writing. But when my time gets *wasted* at the expense of my projects like what happened this week with Zero Retries, *I am going to be saying NO unless I have control of the writing project* so that I

have assurance that my limited writing time that isn't Zero Retries *won't be wasted*.

## No Update on IP400 Network Project This Week

In Zero Retries 0204, I said:

### Update on IP400 Next Issue and Orders In Progress

Partly as a result of my experiences and first-time hands-on with IP400 Ichiban at Hamvention 2025 a couple of weeks ago, there have been some adjustments to IP400 planning, technology, hardware, and some advancements in software.

Thus Martin Alcock VE6VH and I will have an update on all of that and more in next week's Zero Retries. Not to bury the lede, nothing bad, all good.

It was decided to postpone that update for at least a week, and thus no IP400 Network Project news for now.

## Seminar at SEA-PAC 2025 - Technological Innovation in Amateur Radio

Here is the post presentation version of my slide deck for my seminar at SEA-PAC 2025 (Seaside, Oregon, US), presented on Saturday 2025-05-31. As with most of my presentations, I'm trying to "get the word out" about how much technological innovation in Amateur Radio is actually occurring... *that you're probably not hearing about in the "mainstream" Amateur Radio media*.



SEA-PAC 2025 Seminar - Technological Innovation In Amateur Radio

174KB · PDF file

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By Steve Stroh N8GNJ Presented 2025-05-31

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## What a World It Would Be...

Imagine Amateur Radio where the free content of publications like Amateur Radio Daily and Weekly, Ham Radio Ireland, SARC Communicator, Zero Retries, The Random Wire, and Zero Retries can all be consolidated together cleanly into a single "consolidated publication" using an AI.

### *What a world that would be!*

And I think it's coming. I would really hate to be a subscription based publication that doesn't embrace at least some open / free content model so that potential customer s/ subscribers could see something of your publication without "pay us first, then we'll show you our publication".

I state as often as I can that the enemy of "paywall publications" isn't piracy... it's irrelevancy in competition with all of the fine publications mentioned above... all of which are free to access by anyone, anywhere in the world, increasingly being able to read them in any language thanks to instantaneous and nearly free AI translation.

###

Have a great weekend, all of you co-conspirators in Zero Retries Interesting Amateur Radio activities! I'm not keeping track of the rest of North America, but the little corner of NA that is Whatcom County and Bellingham, Washington (lower Vancouver) is just *absolutely gorgeous* with ample sunshine, moderate temps, modest winds to stir things up, and best of all, Mount Baker is showing off her full glory with her glaciers and her magnificent height. And fresh, sweet *Washington strawberries* are in season for six weeks or so! *Life is good here!*

Steve N8GNJ

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## Raspberry Pi 5 Porch Ops

By Bill Diaz KC9XG

*I received this delightful "shack report" from KC9XG who is a frequent correspondent. - Editor*

Summer is finally here! I got my new back porch Raspberry Pi 5 station operational, almost.

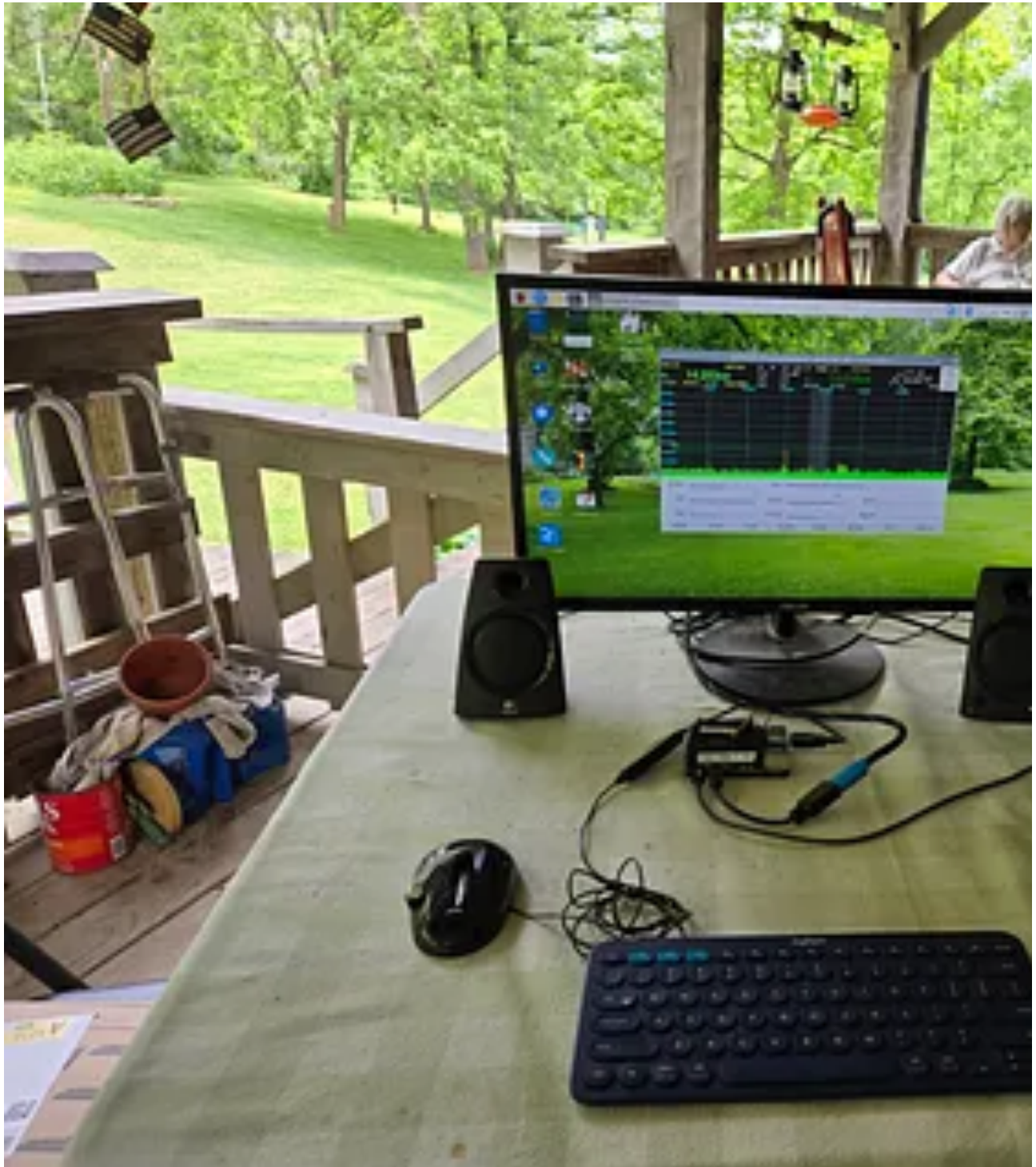


Image courtesy of Bill Diaz KC9XG

My back porch station includes a Raspberry Pi5-4GB, USB PD charger, wireless keyboard, wireless mouse, powered speakers and 23" monitor. I'm keeping the RPi500 and RPi Monitor inside for use at the easy chair. It's a Pain In the *Armchair* to move it to and from the porch. Thus I'm worried about wear and tear on the RPi500 HDMI micro and USB C connectors as well. I've already had one HDMI micro adapter cable fail.

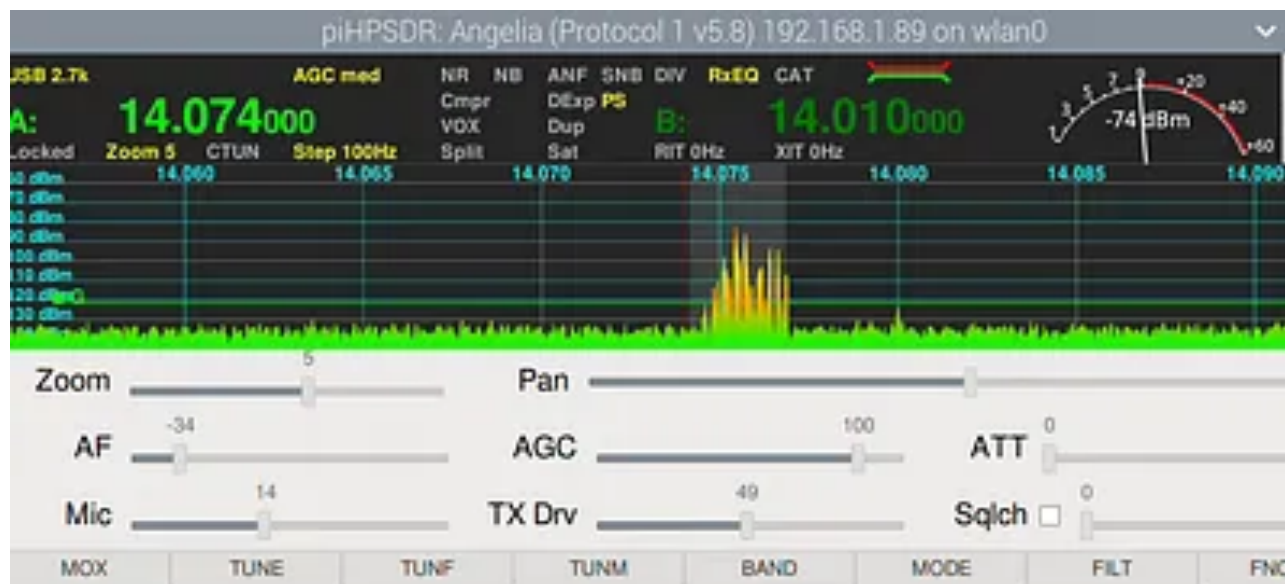


Image courtesy of Bill Diaz KC9XG

I also had some issues with Wi-Fi on the porch. I initially saw occasional sequence errors. It's operating acceptably now, but I will likely use Ethernet in the future. I wish the RPi5 had an external Wi-Fi antenna.

For the radio, I have a PiHpSDR running P1 ANAN-100D (located in the basement shack) @192k sample rate using 4-5% of RPi5 CPU, @45C, with the fan coming on intermittently. PiHpSDR @48k sample rate uses 2-3% of CPU according to Task Manager. However, other running apps can occasionally cause issues such as sequence errors and drop outs. I have not observed or heard any issues when running only PiHpSDR over several hours.

I'm really impressed with the RPi5 hardware. It's fast enough for everyday browsing and email, unlike previous versions of the Raspberry Pi.

*KC9XG also submitted an item for ZR > BEACON in this issue. - Editor*

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Graphic generated by ChatGPT, with prompts from Steve Stroh. NOT AN OFFICIAL RASPBERRY PI LOGO!

## Minor Scoop About FlexRadio's Impressive Engineering

By Steve Stroh N8GNJ

*I remain gobsmacked by FlexRadio's development of the incredibly innovative Aurora radio units that FlexRadio demonstrated...and available for purchase...at Hamvention 2025 in May. While this story is a small innovation compared to the engineering of Aurora, it is, to me, a significant and very forward-thinking (future proofing) development by FlexRadio.*

In waiting for my seminar speaking slot at SEA-PAC 2025, I dropped in at the end of the FlexRadio seminar being presented by FlexRadio's Chief Technology Officer Steve Hicks N5AC... and I heard something very Zero Retries Interesting. As far as I'm aware, this info is a bit of a "scoop" as I have not heard this reported elsewhere.

The processor system in the [FlexRadio 8000 series, and the new Aurora series](#) (and other FlexRadio products) is a [Raspberry Pi Compute Module 4 \(CM4\)](#).

In hearing this, my respect for FlexRadio went up yet another notch as using a CM4 is a pragmatic, cost-effective, well-supported choice for the computer embedded in a FlexRadio unit.

There are ~~two~~ *three* minor stories that accompany this reveal. The first is that FlexRadio was working on developing their own unique processor board that would use an ARM processor. Development of the FlexRadio ARM board was taking a while and so that the software developers could do development on the two radios, a CM4 was "grafted" into the prototype radio(s). The CM4 worked so well, that development of the FlexRadio ARM board was abandoned and the CM4 became the "official" processor board.

The second minor story is that it's possible (but not, I was told later, currently in development or supported) to use a [Raspberry Pi Compute Module 5](#) in place of the CM4. The CM5 is designed as a drop in replacement (at least most of the hardware I/O) for the CM4.

I won't gush about the improvements in the CM5 beyond the CM4 - [I'll let Raspberry Pi cofounder Eben Upton speak to that](#). But suffice it to say that there's a very reasonable upgrade path for adding more compute power, memory, storage, etc. to the FlexRadio 8000 and Aurora series radios, when that's needed.



The third minor story is:

### [FreeDV 2.0.0 released](#)

FreeDV 2.0.0 has been released, containing the first official release of the RADE V1 mode previously trialled over several preview releases. [Radio Autoencoder](#) (RADE) technology is a new approach to sending speech over HF radio. It combines Machine Learning (ML) with classical DSP to send high quality speech over HF radio at SNRs as low as -2dB in a bandwidth of 1500 Hz.

Recall that FreeDV Radio Autoencoder (RADE) was demonstrated at Hamvention 2025 (May) running on a *Raspberry Pi 5*. The core capabilities of the Raspberry Pi 5 and the Raspberry Pi Compute Module 5 are the same.

*I'm not saying that it's easy, or planned, or ready...* but it seems that it may well be *possible* to run FreeDV RADE *inside* the FlexRadio 8000 or Aurora series, once an upgrade from the CM4 to the CM5 is developed. Given the diminutive price differences of the variants of the CM5, it seems reasonable that when FlexRadio does decide to offer upgrades from the CM4 to the CM5, it would opt for the "top end" variant CM5, with 16 GB of SDRAM and eMMC of 64GB. And, it seems to me, that in the not too distant future there will be additional variants of the CM5 that offer more RAM and storage... not to mention the potential of a Raspberry Pi Compute Module 6 with even more compute capability.

I've given FlexRadio a bit of ~~grief~~ *encouragement* over the past year that FlexRadio has not implemented the open source FreeDV mode *in* their radios. Various personnel at FlexRadio have graciously, patiently explained to me why that is:

- There were no longer sufficient compute / memory / storage resources in the FlexRadio products prior to the 8000 series to do so. In the 8000 series, and the Aurora series, there is ample compute / memory / storage to implement new modes such as FreeDV (but not RADE - see below).
- FreeDV has not been a stable implementation, with frequent updates. Trying to implement FreeDV is a moving target.
- To date, "FreeDV" hasn't demonstrated any interest in doing so. FlexRadio has a well-supported [Application Program Interface \(API\) program](#) that suggests "*Add new modes to the radio*", so a "FreeDV built-in" would seem to be a project for FreeDV as much as it might be a project for FlexRadio.
- *FreeDV RADE* requires much greater compute resources than FreeDV, so FlexRadio is back at the "... no longer sufficient compute / memory / storage resources" situation.

But... couple the release of a (stable?) FreeDV 2.0.0 with an upgrade from the CM4 to a CM5 16 GB SDRAM / 64 GB eMMC, and perhaps it's then feasible to run FreeDV RADE inside the FlexRadio 8000 and Aurora.

I think there's reasonable incentive for:

- FreeDV to try to port FreeDV RADE to the FlexRadio API to run on the 8000 / Aurora. If it can be done there, other manufacturers want to compete with FlexRadio.
- FlexRadio to attempt the upgrade (perhaps even retrofit existing customer units) to a CM5 16 GB SDRAM / 64 GB eMMC. FreeDV RADE is a very impressive capability and would showcase FlexRadio's capabilities even more - an "exciting new mode (FreeDV RADE) for an exciting new radio (Aurora)".

Kudos to the FlexRadio hardware (and software) engineering teams for this very rational and forward-thinking choice of core compute capabilities.

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## Thorough Explanation of Single Frequency Digital Mobile Radio Repeater

By Steve Stroh N8GNJ

This article has my byline, but there are three primary authors that are due credit, thanks to the collaborative nature of "open publishing" of technical Amateur Radio articles via the Internet.

**The first credit due** is to Cale Mooth K4HCK for his article on Amateur Radio Daily - [Ham Radio Ireland Magazine](#). I was not previously aware of [Ham Radio Ireland \(HRI\)](#) - it's an *excellent* Amateur Radio magazine published bimonthly, free, it's thorough, good length, and great production value... *and has a reasonable amount of Zero Retries Interesting content!* HRI reminds me a lot of the excellent [Surrey Amateur Radio Communications \(SARC\) Communicator](#), which I call a newsletterzine.

So, always curious for something good to read, I downloaded the three 2025 issues of HRI: [May 2025](#), [April 2025](#), and [January 2025](#) - for an actual download, click the Download link in the upper right hand corner of each issue.

**The second credit due** is to Steve Wright EI5DD. At the download page, there is this explanation by HRI Editor Steve Wright EI5DD:

HAM RADIO IRELAND

The Magazine written by the Radio Experimenter for the Radio Experimenter

We are freelance and in absolutely no way affiliated to any National Society as this enables us to report on the activities of all Clubs, Groups and organisations from both the North and South of Ireland.

We report forthcoming Special Event Stations and activities and include features and articles of both Radio and electronic interest.

Would you like to write an article for the Magazine? - we are open to any suggestions and will assist anyone who has never publicised an article before.

We officially re-launched on Saturday the 25th of January 2025

We are introducing a new flip-book format in addition to the downloadable format at the end of May.

He had me at Radio Experimenter, but then really grabbed me with:

... absolutely no way affiliated to any National Society

Independent!

Thus, kudos to EI5DD for assembling a great publication!

**The third credit due** is to author Patrick McGuinness - G4FDN / EI2JW in the February 2025 issue of Ham Radio Ireland (HRIVol30125.pdf) for his *excellent, thorough* four page (pages 17-20) article **Configuration of a DMR Single Frequency Repeater (SFR)**.

DMR is different to most other digital voice modes in that it uses time division multiplexing for accommodating two voice channels in two separate time slots. The most common form of a DMR repeater uses two frequency two time slot operation giving the ability to carry two simultaneous separate QSOs on the same repeater. *The less used mode of operation is called a Single Frequency Repeater (SFR) using one time slot to receive on and the other to transmit on.*

*I knew this was possible*, having seen it mentioned in a manual or catalog for Hytera DMR repeaters (SFR was mentioned for a Hytera portable repeater), but assumed (incorrectly, apparently) that a DMR SFR was a unique mode by Hytera where they had “bodged” the DMR specification. I’ve never seen another reference to a DMR SFR - until now.

G4FDN / EI2JW explains in amazing detail how to configure two DMR radios, a Anytone AT-D878UVII Plus VHF/UHF FM/DMR Transceiver and a Retevis P1 FM/DMR UHF transceiver.

This mode - Single Frequency Repeater using Time Domain Multiple Access (TDMA) - one time slot used for receive, and one time slot used for transmit, seems to me pretty much the *ultimate* DMR repeater:

- Single frequency - 2x the channel efficiency of a traditional separate receive / separate transmit using a duplexer.
- Between the narrower channels of DMR digital voice (12.5 kHz) and needing only one channel, by my math DMR SFR’s are 4x as spectrally efficient as traditional FM repeaters.
- No expensive duplexer! *No. Expensive. Duplexer!!!* (There are some “RF” benefits from duplexers or cavity filters, but with a SFR you don’t need an expensive, fussy duplexer.)

With the capability of DMR SFRs I think we can begin retiring the repeater technology of the 1970s - wide channels, x2, interference prone analog FM (no FEC, etc.).

This... rocks... my... world... **SINGLE** frequency repeaters. And you can apparently (per G4FDN / EI2JW) using normal Amateur Radio DMR equipment... very carefully configured.

Kudos to G4FDN / EI2JW for this excellent article!

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## ZR > BEACON

By Steve Stroh N8GNJ

*Short mentions of Zero Retries Interesting items.*

### KC9XG is Now Windowless

Email from Bill Diaz KC9XG:

Recently had my [Microsoft] Surface Pro 7 laptop die. Instead of buying another expensive Windows machine, I decided to go with the Raspberry Pi 500 and Raspberry Pi 15.6" monitor for about \$240, including shipping and tax.



The RPi5/500 has 802.11AC and Bluetooth 5.0/BLE, which is somewhat dated compared to my recently departed Surface Pro. I'm using a Bluetooth mouse and PD charger (powering both RPi500 and monitor).

While the RPi500 has the 40 pin GPIO connector (on the back of the RPi500), I will likely use my Shack RPi5 for a IP400 hat down the road.

Major drawbacks of the RPi hardware includes loss of portability, and inability to run Windows apps. However, I am slowly regaining most of the capabilities I had with Windows. I'm using Libre Office, Chrome browser, Gimp instead of PhotoShop, Draw instead of Microsoft Paint, Thunderbird for email, and ham apps such as FLDigi, wsjtx, PiHpSDR and hamlib etc. I'm experiencing somewhat of a learning curve...

A big find today was the ability to use <https://messages/google.com/web> to send and receive SMS with the RPi via my Android phone.

The move from proprietary Windows to RPi [Linux] appears to have been mostly successful. There are still a few warts and frustrations but I am happy with the results so far, including the reduced cost of the RPi hardware compared to a Surface Pro laptop.

A brief email exchange later...

Yes, SD [for storage on the Raspberry Pi units] is not the best. I have a Samsung USB HD and a noname NAS that I can use for the big files.

The RPi 15.6" monitor has some drawbacks for me. The HDMI, USB power and TRS audio connectors are underneath the monitor "kickstand". Unfortunately, if you use a 100mm VESA attachment, it *completely covers up those connectors*. I had to add a 6-inch female to male HDMI adapter cable *and* a 6-inch female to male USB adapter cable to allow me to easily disconnect the monitor so I can move it easily. I recommend having those adapter cables available even if you don't use a VESA stand.

The monitor speakers are OK, for ham use, but I don't think they would be good for music etc. I added a 6-inch male to female TRS cable, just in case.

I will be attaching a USB microphone to the RPi500.

The keyboard on the Raspberry Pi 500 is "snappy" enough. The only problem I have is that the space bar seems to be a bit intermittent. I have to hit it several times sometime.

I have no clue what the leftmost LED is for. The middle LED is Caps Lock and the right LED is for Power and Activity, etc.

KC9XG's articles and lessons learned are timely as I purchased a Raspberry Pi 500 during my trip to Micro Center in Columbus, and I plan to invest in several [Raspberry Pi Monitors](#) for my work with multiple IP400 Ichiban units.

### **Data Repeaters - Just Regular, Duplex, FM Repeaters But Used for Data-Over-FM... Right?**

Justin Overfelt AB3E asks:

When you talk about "data repeaters" like in the last newsletter, you just mean regular, duplex FM repeaters but used for data-over-FM, right?

If so, my club has definitely experimented with using fldigi modes over our repeater. Lots of trustees in the area don't like data on their repeaters, but seeing as I'm the trustee of ours, that's not an issue 😊

*My reply (which I warned Justin would turn into a ZR article, and he was OK with it):*

Data repeaters can be as simple as "sound modes over FM repeaters".

All of the fldigi modes work fine as they're narrow bandwidth intended for HF.



Even 1200 bps AFSK works fine for FM repeaters.

If I was “stuck” with just using an unmodified FM repeater (couldn’t make changes to the repeater) I’d be using VARA FM. Of course, VARA FM requires Windows, it’s proprietary, it requires a fee for the fastest speeds, etc. But it works well, it’s *fast*, and when you pair it with the VarAC companion app, man, it’s slick.

I’ve seen references about later versions of VARA FM having optimizations for use over repeaters. It’s purely a guess, but it makes sense that such an optimization would be to not use the portion of the audio spectrum that would contain CTCSS tones as they’d be transmitted continuously and that portion wouldn’t be able to convey useful data.

VARA FM is worth dedicating a Windows appliance to (and I’ve seen a few recipes for installing Linux + WINE + VARA FM + other apps on a Raspberry Pi 4 or 5), and paying the fee.

But no, my concept for data over repeaters runs much, much deeper than just using “stock FM”.

There’s also...

- D-Star DD mode - if you use the Icom 1200 MHz repeater, it’s a data repeater (128 kbps) that’s usable by the (discontinued) Icom ID-1, the Icom IC-9700, and the Icom IC-905.
- D-Star DV modes - All D-Star DV repeaters will pass the “DV Fast Data” mode.
- M17 includes a data mode, so an M17 repeater should be able to pass M17 data as easily as it passes M17 Digital Voice.
- DMR has a data option, though it’s never been reasonably defined, that I’ve seen. I’ve seen proprietary implementations of Motorola Mototrbo data and Hytera data.
- P25 has a data option I think, but again, not well defined except for proprietary implementations like Motorola.
- System Fusion has a data mode, but it’s locked down to just being able to send images.
- Originally I was championing adding MMDVM, best illustrated by this article - <https://n5amd.com/digital-radio-how-tos/make-mmdvm-digital-repeater/>.

That gets you all the digital voice modes, plus some data such as paging (POCSAG), 1200 bps AFSK AX.25, and (the sexy) MMDVM-TNC mode (still in development, with not much actual on-the-air testing).

And best of all, it’s on the “next few months” roadmap to develop a repeater module (called Supernode) to add IP400 to a repeater. It will add all the MMDVM goodness in addition to IP400.

My SuperPeater concept which hasn’t been entirely eliminated by IP400, is that a repeater should be able to receive one data mode (like VARA FM or even 1200 bps AFSK AX.25) and transmit it out on a high speed data stream that you can receive with an inexpensive Software Defined Receiver dongle.

## Hot Iron #129 is Posted to the Website

Via email from Frank Barnes W4NPN:

Spring has arrived (in the Northern Hemisphere, at least, Autumn below the equator). This means that the May quarterly issue of **Hot Iron** (#129) is posted to the website.

Please know that the URL for the Hot Iron website has changed to a more permanent web host due to circumstances too tedious to relate here. It is now permanently located at [www.w4nnpn.org](http://www.w4nnpn.org). The old URL ended in .net. If you have created a screen icon link to the website, please update it.

[Here is the direct link to the library of issues](#); click on *Hot Iron* #129 to read or download the May issue. The earlier issues contain a wealth of information; please read these as you can.

Several other links might be of interest to our readers:

- 1) The [Subject Matter Index page](#) correlates *Hot Iron* topics to each newsletter which addresses the subject.
- 2) The updated [Hot Iron Reference Page](#) contains tables, reference material and other “standard” information.
- 3) The ["Construction" page](#) provides links helpful for construction projects.
- 4) The ["Resources" page](#) contains much information that may be of help.

There is some crossover between the “Construction” and “Resources” pages, with both sometimes addressing similar or related information.

All the above pages receive constant updating as new material is found. Please send any comments, suggestions and new material finds to Frank at [fbw4nnpn@gmail.com](mailto:fbw4nnpn@gmail.com).

We hope you find this edition to be of interest and we solicit your comments and ideas for future issues.

73,

Frank Barnes, W4NPN  
Peter Thornton, G6NGR  
[www.W4NPN.org](http://www.W4NPN.org)  
Chapel Hill, NC

Grid Square FM05  
Cell 919.260.7955

I had been in mourning for months that Hot Iron seemed to be no more - the website seemed permanently offline. I periodically pinged Peter (no responses from Frank) over the course of months. Peter assured me (and I'm sure many others) that the website "should be back soon". Now, *it is back*, and the delightful Hot Iron newsletter is being published once again.

Kudos to W4NPN and G6NGR! Receiving that email made my week!

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## Comments Summary From Previous Issue

*Comments from Zero Retries 0204:*

- My aversion to the use of dBm in favor of absolute units like Watts, isn't widely shared by ubertechies like Paul Elliott.
- JS8Call resuming development - there is much rejoicing and some funny commentary about C being converted to Fortran and then to C++.
- A detailed plaint about the state of M17. I had intended to write an article to reply, but the editing time of Zero Retries 0205 ran way too long, so hopefully next issue.

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## Zero Retries Boilerplate

The [Zero Retries Store](#) is now open for business with quality Zero Retries branded merchandise and items being retired from Steve's N8GNJ Labs.

These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA, and linked to the Internet via [Starlink Satellite Internet Access](#).

See the **Zero Retries Boilerplate** page for significant acknowledgements and other information relevant to Zero Retries. For new readers of Zero Retries, that page, and the **About Zero Retries** page has useful information to check out.

My ongoing *Thanks* to:

Tina Stroh KD7WSF for, well, *everything*!

Jack Stroh, Late Night Assistant Editor Emeritus

Shrek Stroh, Late Night Assistant Editor In training

### **Annual Founding Members who generously support Zero Retries financially:**

Founding Member 0000 - Steven Davidson K3FZT (Renewed 2024)

Founding Member 0001 - Randy Smith WU2S (Renewed 2024)

Founding Member 0002 - Chris Osburn KD7DVD (Renewed 2024)

Founding Member 0003 - Don Rotolo N2IRZ (Renewed 2024)

Founding Member 0004 - William Arcand W1WRA (Renewed 2024)

Founding Member 0006 - Todd Willey KQ4FID (Renewed 2024)

Founding Member 0007 - Merik Karman VK1DF / VK2MKZ (Renewed 2024 *with two Founding Member subscriptions!*)

Founding Member 0008 - Prefers to Remain Anonymous 14 (Renewed 2024)

Founding Member 0009 - Prefers to Remain Anonymous 19 (Renewed 2025)

Founding Member 0011 - Rick Prelinger W6XBE (New 2024)

Founding Member 0012 - Ryan Tolboom N2BP (New 2024)

Founding Member 0013 - Newton White N4EWT (New 2025)

Founding Member 0014 - Joe Hamelin W7COM (New 2025)

Founding Member 0015 - Rich Stocking N7OP (New 2025)

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**You thousands of readers of Zero Retries** without which there would be little point in publishing this newsletter.

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